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## APPENDIX A

# SITE GEOLOGY AND SOIL BORING LOGS

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PARCEL D  
SITE INVESTIGATION AND EXCAVATION  
BOEING REALTY CORPORATION  
C-6 FACILITY  
SEPTEMBER 1999



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## APPENDIX A SITE GEOLOGY AND SOIL BORING LOGS

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### SITE GEOLOGY

Soil conditions consisted generally of very dark brown, moist, silty clay from the surface to a depth of 4 to 8 feet bgs. The clay is underlain generally by slightly moist, hard, dark yellowish brown clayey silt. The clayey silt generally becomes lighter in color with depth, and grades in and out from clayey silt to sandy silt. Calcareous nodules were commonly observed, most often between 14 and 16 feet bgs. Clayey or sandy silt continues to the terminal depth in most of the soil borings, but is underlain by silty sand at 16 to 18 feet bgs in the westernmost borings B1 and B5. The silty sand is light olive brown, fine, and slightly moist, and continued to 25 feet bgs in both borings.

No soil discoloration, odors, or high photoionization detector readings were observed during the drilling and sampling at Parcel D. Groundwater was not encountered in any of the soil borings.

# Boring Log

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BORING LOCATION <b>Parcel D</b>		Boring Name <b>B-1</b>
DRILLING COMPANY <b>Layne Christenson</b>	DRILLER <b>Ruben</b>	Project Name <b>Boeing C-6</b>
DRILLING METHOD (S) <b>Direct Push</b>	DRILL BIT (S) SIZE <b>1.75"</b>	Project Number <b>994009.00</b>
DEPTH TO WATER <b>Not Encountered</b>		ELEVATION <b>Not Surveyed</b>
LOGGED BY <b>J. Knight</b>		TOTAL DEPTH <b>25 feet</b>
		DATE STARTED <b>6-16-99</b>
		DATE COMPLETED <b>6-16-99</b>

SAMPLES					Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Blows per ft	Head Space Reading (gpm)					
continuous core ↓							CL	10YR 2/2	Silty CLAY: very dark brown, moist, firm
					5			10YR 5/4	yellowish brown, slightly moist, hard
					10		ML	10YR 5/4 2.5Y 4/4	Clayey SILT with fine sand: yellowish brown, slightly moist, hard grades to Sandy SILT with Clay, olive brown, slightly moist, very stiff
					15				grades to Clayey SILT with a trace of fine Sand, moist, very stiff, some calcareous nodules
					20		SM	2.5Y 5/6	grades to Sandy SILT with Clay Silty SAND: light olive brown, fine, slightly moist, medium dense
					25				Boring terminated at 25 feet
					30				
					35				
					40				

# Boring Log

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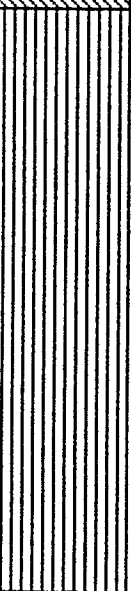

BORING LOCATION <b>Parcel D</b>					Boring Name <b>B-2</b>	
DRILLING COMPANY <b>Layne Christenson</b>			DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>			DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>					ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>26 feet</b>
LOGGED BY <b>J. Knight</b>					DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

SAMPLES				Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Test Spec Head Space (ft)					
continuous core ↓						CL	10YR 2/2	Silty CLAY: very dark brown, moist, firm
				5		ML	10YR 3/4	Clayey SILT: dark yellowish brown, slightly moist, hard
				10				some fine sand, decreasing clay
				15			2.5Y 4/4	increasing clay calcareous nodules, olive brown
				25				
				30				Boring terminated at 26 feet
				35				
				40				

# Boring Log

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BORING LOCATION <b>Parcel D</b>						Boring Name <b>B-3</b>	
DRILLING COMPANY <b>Layne Christenson</b>				DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>				DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>						ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>26 feet</b>
LOGGED BY <b>J. Knight</b>						DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

SAMPLES					Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Long Core	Head Space (feet)					
continuous core ↓					5		CL	10YR 2/1	Silty CLAY: black, moist, firm
							10YR 3/3	dark brown, slightly moist, hard	
					10		ML	10YR 3/4	Clayey SILT: dark yellowish brown, slightly moist, hard
					15		2.5Y 4/4	grades to Sandy SILT, olive brown, with Clay	
				20	2.5Y 5/4		grades to Clayey SILT: light olive brown, slightly moist, hard		
				25		CL	2.5Y 5/3	Silty Clay: light olive brown, slightly moist, hard	
					30				Boring terminated at 26 feet
					35				
					40				

# Boring Log

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BORING LOCATION <b>Parcel D</b>					Boring Name <b>B-4</b>	
DRILLING COMPANY <b>Layne Christenson</b>			DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>			DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>					ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>26 feet</b>
LOGGED BY <b>J. Knight</b>					DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

SAMPLES				Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Blows per 6"					
continuous core						CL	10YR 2/2	Silty CLAY: moist, firm, very dark brown
				5			10YR 5/4	yellowish brown, slightly moist, hard
						ML	2.5Y 5/4	Clayey SILT: light olive brown, slightly moist, hard
				10				grades to fine Sandy SILT with clay
			15				some calcareous nodules, increasing clay	
						2.5Y 5/4	grades to Clayey SILT, with a trace of fine sand, slightly moist, hard	
				20				
				25				calcareous nodules
								Boring terminated at 26 feet
				30				
				35				
				40				

# Boring Log

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BORING LOCATION <b>Parcel D</b>		Boring Name <b>B-5</b>
DRILLING COMPANY <b>Layne Christenson</b>	DRILLER <b>Ruben</b>	Project Name <b>Boeing C-6</b>
DRILLING METHOD (S) <b>Direct Push</b>	DRILL BIT (S) SIZE <b>1.75"</b>	Project Number <b>994009.00</b>
DEPTH TO WATER <b>Not Encountered</b>		ELEVATION <b>Not Surveyed</b>
LOGGED BY <b>J. Knight</b>		TOTAL DEPTH <b>25 feet</b>
		DATE STARTED <b>6-16-99</b>
		DATE COMPLETED <b>6-16-99</b>

SAMPLES					Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Boys' Port	Head Space (ft)					
continuous core					5		CL	10YR 3/3	Silty CLAY: dark brown, moist, very stiff
					10		ML	10YR 4/4	Clayey SILT: dark yellowish brown, slightly moist, hard grades to fine Sandy SILT decreasing sand
					15			2.5Y 4/4	grades to Clayey SILT: olive brown, slightly moist, hard some calcareous nodules fine sand, decreasing clay
					20		SM	2.5Y 5/4	Silty SAND: light olive brown, fine, slightly moist, dense
					25			2.5Y 5/6	light olive brown, medium dense decreasing silt
					30				Boring terminated at 25 feet
					35				
					40				

# Boring Log

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BORING LOCATION <b>Parcel D</b>				Boring Name <b>B-6</b>	
DRILLING COMPANY <b>Layne Christenson</b>		DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>		DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>				ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>26 feet</b>
LOGGED BY <b>J. Knight</b>				DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

SAMPLES				Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Tested (ft)					
continuous core						CL	10YR 2/2	Silty CLAY: very dark gray brown, moist, firm
							10YR 3/4	dark yellowish brown, slightly moist, hard
				5		ML	10YR 4/4	Clayey SILT: dark yellowish brown, slightly moist, hard
							2.5Y 4/4	olive brown, with calcareous nodules
			10				2.5Y 5/3	grades to Sandy SILT with atrace of Clay, light olive brown
								grades to Clayey SILT
				15				
				20				
				25				grades to Sandy SILT with Clay, slightly moist, hard some calcareous nodules
								Boring terminated at 26 feet
				30				
				35				
				40				



# Boring Log

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BORING LOCATION <b>Parcel D</b>					Boring Name <b>B-8</b>	
DRILLING COMPANY <b>Layne Christenson</b>			DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>			DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>					ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>26 feet</b>
LOGGED BY <b>J. Knight</b>					DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

Driven	Recovered	Collected	Blows per ft	Head Splice Reading (ft)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
continuous core					0		CL	10YR 2/2	Silty CLAY: very dark brown, moist, firm
					5			10YR 3/6	dark yellow brown, slightly moist, hard
					10		ML	10YR 4/4	grades to Clayey SILT: dark yellow brown, slightly moist, hard some fine sand
					15			10YR 5/6	grades to Sandy SILT: yellowish brown, slightly moist, stiff
					20			2.5Y 4/4	grades to Clayey SILT: olive brown, slightly moist, hard
					25				
					30				Boring terminated at 26 feet
					35				
					40				

# Boring Log

Kennedy/Jenks Consultants

BORING LOCATION					Boring Name <b>B-9</b>	
Parcel D			DRILLING COMPANY		DRILLER	
Layne Christenson			Ruben		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S)			DRILL BIT (S) SIZE		Project Number <b>994009.00</b>	
Direct Push			1.75"			
DEPTH TO WATER					ELEVATION	TOTAL DEPTH
Not Encountered					Not Surveyed	16 feet
LOGGED BY					DATE STARTED	DATE COMPLETED
J. Knight					6-16-99	6-16-99

Driven	Recovered	Collected	Blow's per foot	Head Space (ft)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
continuous core					5		CL	10YR 2/2	Asphalt, 3" Silty CLAY: very dark brown, moist, firm
								10YR 3/4	dark yellowish brown
								10YR 4/4	dark yellowish brown, very hard
					10		ML	10YR 4/6	grades to Clayey SILT: dark yellowish brown, slightly moist, hard
					15				some fine sand, hard
					20				Boring terminated at 16 feet
					25				
					30				
					35				
					40				

# Boring Log

Kennedy/Jenks Consultants

BORING LOCATION <b>Parcel D</b>						Boring Name <b>B-10</b>	
DRILLING COMPANY <b>Layne Christenson</b>				DRILLER <b>Ruben</b>		Project Name <b>Boeing C-6</b>	
DRILLING METHOD (S) <b>Direct Push</b>				DRILL BIT (S) SIZE <b>1.75"</b>		Project Number <b>994009.00</b>	
DEPTH TO WATER <b>Not Encountered</b>						ELEVATION <b>Not Surveyed</b>	TOTAL DEPTH <b>16 feet</b>
LOGGED BY <b>J. Knight</b>						DATE STARTED <b>6-16-99</b>	DATE COMPLETED <b>6-16-99</b>

SAMPLES					Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
Driven	Recovered	Collected	Blow Count per ft	Head Space (inches)					
continuous core					0	CL	10YR 3/3	Concrete, 3"	
					5		10YR 3/6	Silty CLAY: dark brown, moist, stiff	
					10	ML	10YR 5/6	dark yellowish brown, hard	
					15		10YR 5/4	Clayey SILT: yellowish brown, slightly moist, hard	
						2.5Y 4/4	some fine sand, very stiff		
								grades to Sandy SILT: yellowish brown, fine sand, slightly moist, very stiff, some clay	
								olive brown	
								some calcareous nodules, decreasing sand	
					20			Boring terminated at 16 feet	
					25				
					30				
					35				
					40				



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## 7. CONCLUSIONS

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The site investigation of Parcel D was conducted in accordance with the approved Sampling and Analysis Plan (IESI 1999e). The data generated during this investigation will support future site remediation, feasibility studies, groundwater investigations, and risk assessment, should such actions become necessary.

Initially, soil samples were collected from 10 borings. An elevated concentration of total arsenic was detected in one of these samples at a concentration of 18 mg/kg. Other analyses did not indicate other contaminant concentrations above the HBRGs established for the site. Delineation samples were collected to determine the extent of the arsenic contamination, which measured approximately 400 by 200 feet in area, from the surface to approximately 1.5 feet bgs, with four areas to approximately 2.5 feet bgs.

Arsenic-impacted soil was excavated from an area measuring approximately 400 by 300 feet, to depths between 1.5 and 2.5 feet. Confirmation samples were collected following the excavation to ensure that all contaminated soil had been removed. Additional soil was excavated when the samples indicted total arsenic concentrations greater than 14 mg/kg. According to the final round of confirmation sampling, total arsenic concentrations are below 14 mg/kg. No further excavation of arsenic-impacted soil is deemed necessary as a result of this effort. A Parcel D post-demolition risk assessment is being prepared to confirm that the site poses no risk to human health or the environment.

Approximately 8,200 cubic yards of non-hazardous soil were transported to the Bradley Landfill for use as daily cover. Forty-two cubic yards of soil were transported to the Kettleman Landfill for disposal as non-RCRA hazardous waste. The disposal activities are documented in the Parcel D Waste Discharge Requirement Monitoring and Reporting document (IESI 1999f).



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## 8. REFERENCES

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Bayley Construction (Bayley) 1998. *Bayley Construction Site-Specific Safety Plan, Boeing Facility, Los Angeles, California.*

Camp Dresser McKee Inc. (CDM) 1991a. *Phase I Environmental Assessment of the Douglas Aircraft Company C-6 Facility, Parking Lot and Tool Storage Yard, Los Angeles, California.* Prepared for McDonnell Douglas Realty Company.

Camp Dresser McKee Inc. (CDM) 1991b. *Phase II Environmental Assessment of the Douglas Aircraft Company C-6 Facility, Parking Lot and Tool Storage Yard, Los Angeles, California.* Prepared for McDonnell Douglas Realty Company.

Chemical Waste Management 1999. *Scope of Work Developed for Boeing Realty Alternate Daily Cover Project.* August.

Integrated Environmental Services, Inc. (IESI) 1997. *Health-Based Remediation Goals for Surface Soils, Douglas Aircraft Company C-6 Facility, Parcel A, Torrance, California.* Prepared for McDonnell Douglas Realty Company. August.

Integrated Environmental Services, Inc. (IESI) 1999a. Letter from Joann P. Ornelas to Augustine Anijelo of the Los Angeles Regional Water Quality Control Board re. conceptual authorization of the Parcel D excavation plan. July 12.

Integrated Environmental Services, Inc. (IESI) 1999b. Memorandum from Anderson Cheng to Joann P. Ornelas re. inspection of Buildings 59 and 59A and storage yard in Parcel D. April 27.

Integrated Environmental Services, Inc. (IESI) 1999c. Memorandum from Anderson Cheng to Joann P. Ornelas re. follow-up information on inspection of Buildings 59 and 59A and storage yard in Parcel D. April 28.

Integrated Environmental Services, Inc. (IESI) 1999d. *Parcel D Excavation Plan, Boeing C-6 Facility, Parcel D, Los Angeles, California.* Prepared for Boeing Realty Corporation. July.

Integrated Environmental Services, Inc. (IESI) 1999e. *Parcel D Sampling and Analysis Plan, Boeing C-6 Facility, Parcel D, Los Angeles, California.* Prepared for Boeing Realty Corporation. May.

Integrated Environmental Services, Inc. (IESI) 1999f. *Parcel D Waste Discharge Requirement Monitoring and Reporting, Boeing C-6 Facility, Parcel D, Los Angeles, California.* Prepared for Boeing Realty Corporation. August.



Kennedy/Jenks Consultants (K/J) 1996a. *Phase I Environmental Assessment, Parcel A*. Prepared for McDonnell Douglas Realty Company. March.

Kennedy/Jenks Consultants (K/J) 1996b. *Phase I Environmental Assessment, Parcel B*. Prepared for McDonnell Douglas Realty Company. April.

Kennedy/Jenks Consultants (K/J) 1996c. *Phase I Environmental Assessment, Parcel C*. Prepared for McDonnell Douglas Realty Company. May.

Regional Water Quality Control Board (RWQCB), Los Angeles 1999a. Letter from Dennis Dickerson of RWQCB, Executive Office to Mario Stavale of Boeing Realty Corporation authorizing the Waste Discharge Requirements for Discharge of Contaminated Soil (File No. 88-57-003 (99)). July 29.

Regional Water Quality Control Board (RWQCB), Los Angeles 1999b. Letter from Augustine Anjiello of RWQCB to Mario Stavale of Boeing Realty Corporation approving the Parcel D Sampling and Analysis Plan for the C-6 Facility (File No. 100.315) (SLIC No. 410). May 27.